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Andrew Vaughan

Hazardous Wastes

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Alberta
ENVIRONMENT

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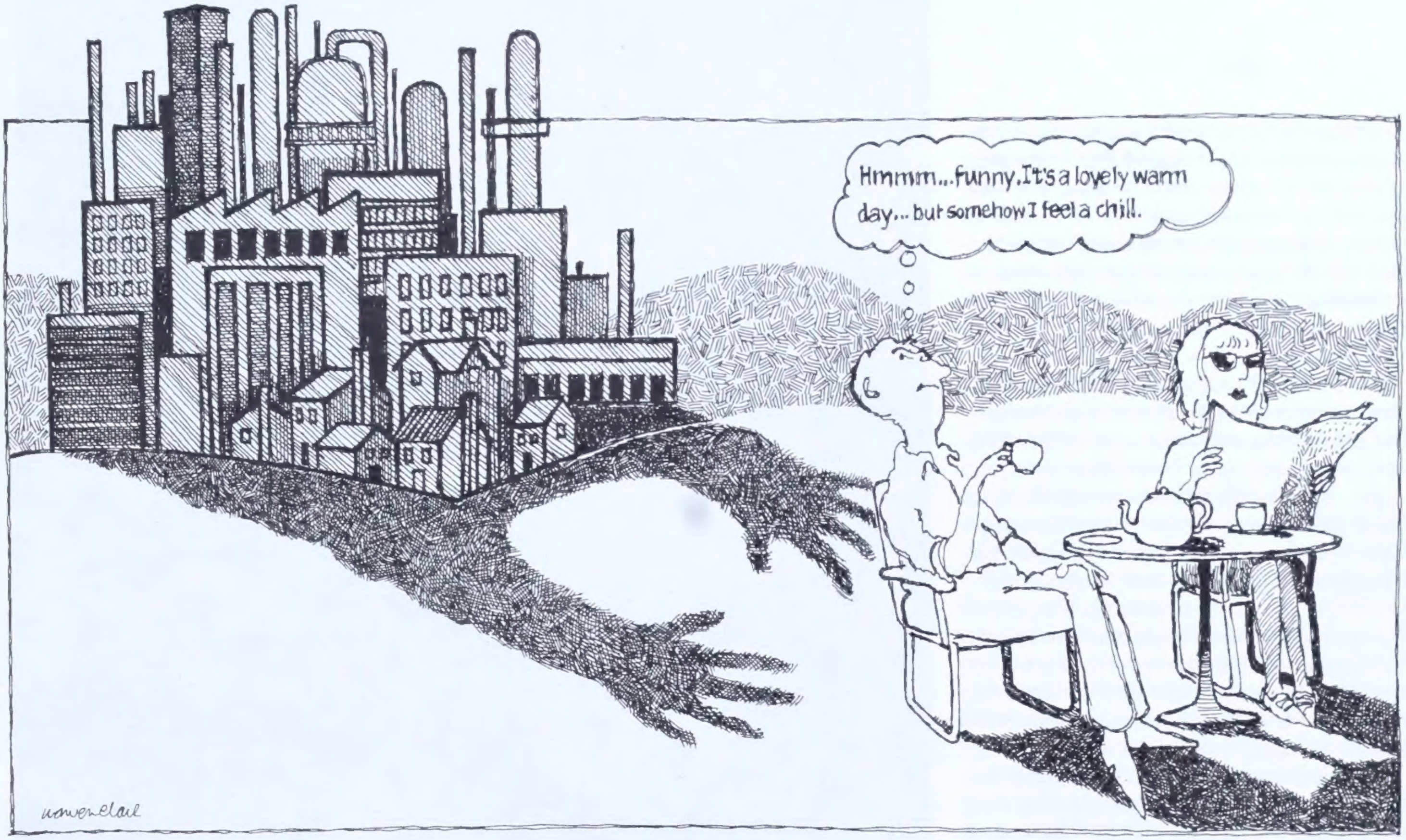
Hazardous Wastes

The key lies in how they are managed.


Hmmm...funny. It's a lovely warm day... but somehow I feel a chill.

If ever two words were destined to arouse deep feelings of alarm, foreboding — and confusion — "hazardous wastes" are the words.

Alarm and foreboding were certainly among the feelings expressed by Fort Saskatchewan residents when a hazardous wastes disposal plant was proposed for their area.

But there was confusion and uncertainty too. Just what *are* hazardous wastes, and where do they come from? How much of them are around our province?

It's no help to the people of Fort Saskatchewan, or to the rest of us, that at this stage of our knowledge about hazardous wastes there are more questions than answers. Defining the term is just the first of many problems.

The United States Environmental Protection Agency defines a hazardous waste as: ". . . any waste or combination of waste which poses a substantial present or potential hazard to human health or living organisms because such wastes are lethal, nondegradable, or persistent in nature; may be biologically magnified, or may otherwise cause or tend to cause detrimental cumulative effects."

That's a definition considered by the citizen-government committee set up by Environment Minister Jack Cookson last fall to examine the problem of hazardous waste management. The committee has also supplied a definition of its own: a hazardous waste is any material having no economic value, found in too large a quantity in an inappropriate location.

Between the two definitions, it's clear that "hazardous wastes" describe a multitude of sins. Radioactive wastes, or toxic pesticide residues, inappropriately disposed of, threaten human and animal life and are obviously hazardous. But dump enough salt solution by a roadside, or oily water into a slough, and the hazards are real, too.

According to Ken Simpson, head of Alberta Environment's waste management branch, the way a waste is managed really decides whether it's hazardous or not; arsenic sealed in a concrete container at the bottom of a salt cavern is "about as safe as you can get," but a pumpkin rotting in a puddle is a real hazard to the life forms in that puddle.

Between the arsenic and the pumpkin there are scores of waste substances (like those noted on Page 6) whose management in Alberta gives cause for concern. And for all those we know about there are bound to be some unknowns.

Volumes are another concern. The Canadian Council of Resource and Development Ministers estimates that Alberta accounts for about 18 per cent of the million metric tons of hazardous wastes generated in Canada every year. But the management committee considers that percentage to be an estimate only; it's been unable to find precise information on the volumes and distribution of hazardous wastes in Alberta.

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Where do these wastes come from? The stories on Pages 9, 11 and 14 deal with some of the major generators — primary and secondary industries, hospitals and research laboratories. And they illustrate a fact which is perhaps surprising: when it comes to hazardous waste disposal, it's the biggest generators who are the most responsible.

That's largely a question of economics: the greater the volume of wastes generated, the greater the incentive to process them and recycle recoverable materials.

Dr. Hu Harries is principal of the firm Hu Harries and Associates, economic consultants, which conducted a study for the management committee on the economics of special waste management. He notes: "In my view most of the hazardous wastes being generated here come not as a consequence of our industrialization but are side-effects of serving two million people with an increasingly commercial service.

"The kinds of hazardous wastes that are here are wastes from photographic processing, car battery manufacturing, and so on . . .

"The people who don't generate enough (waste) to deal with it themselves are the problem."

For those businesses which can't deal with their own hazardous waste disposal, the options in Alberta are limited, as the story on Page 7 shows. Most of the material ends up in municipal landfill sites, and it's becoming more and more clear that a landfill is no place for it.

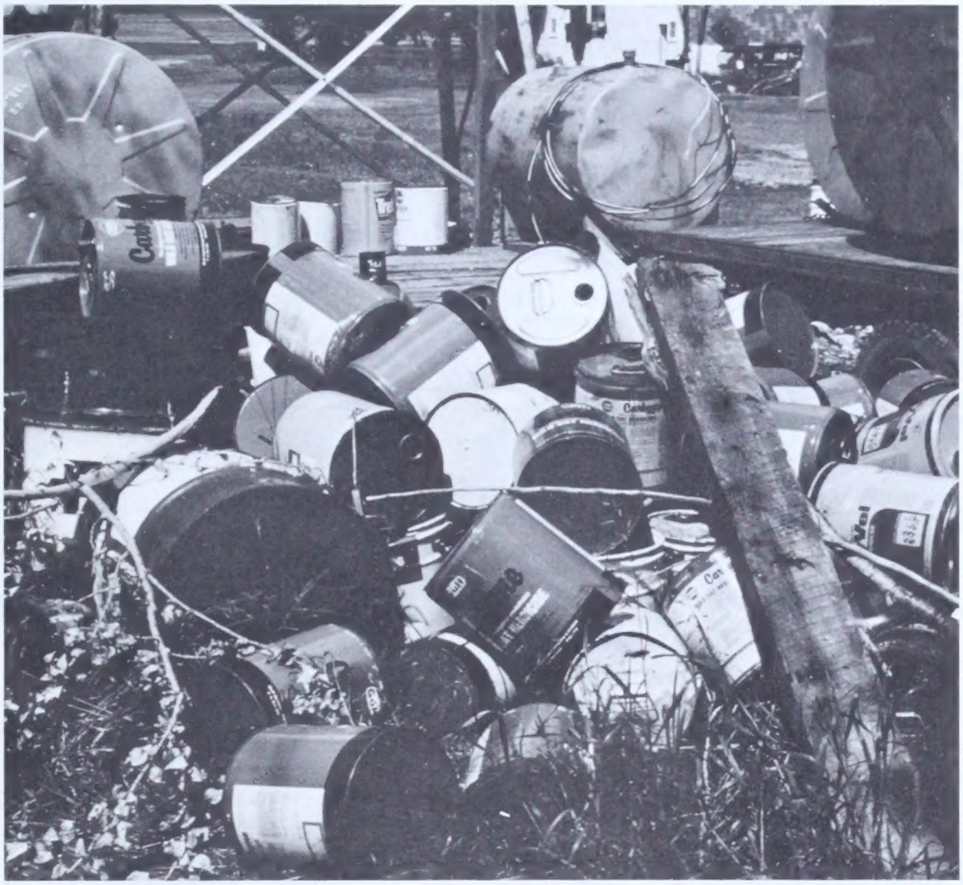
The main reason for this is that the hazardous wastes dumped at the landfill are mostly in liquid form; the concern is that they will percolate through other materials in the site and eventually contaminate the ground water. (They might also react with other substances in the landfill, with unknown and possibly even more hazardous results.)

The provincial board of health has regulations under the Public Health Act which impose some controls on garbage dumping; for instance, special approval is needed to dump inflammable liquids or industrial wastes on a regular basis. But it's all very much a matter of trust; landfill operators usually have no means of checking what a tanker truck's load contains, and often accept such materials without approval.

Concerns are emerging now, too, about the nature of landfill sites. If leaching is likely to be a problem, it's obviously desirable to have a landfill site dug out of heavy clay or some other sort of impermeable material, and located away from a river or stream. Calgary's Forest Lawn landfill site does meet these criteria — but Edmonton's Clover Bar site does not. Clover Bar is in the North Saskatchewan River valley, in the porous material of a former gravel pit; it's only in recent years that the City of Edmonton has dug down to bedrock and inserted a clay liner to counteract the threat of leaching.

There's no need for us to imagine what the worst consequences of simply burying hazardous wastes in the ground might be. In Niagara Falls, New York state, the location of the infamous Love Canal, the evidence is there for all to see. The story on Page 17 gives details of the frightful damage to human health and well-being caused by the dumping of chemicals in the abandoned navigation channel.

But that story also presents another scenario. In the German state of Bavaria, a controlled and comprehensive system of hazardous waste management has been established. The system includes collection points for hazardous wastes, treatment and storage laboratories, transport and landfill.



It's becoming increasingly evident that Alberta, too, must take some steps to manage properly its hazardous wastes. The management committee now considering the province's situation, and others concerned with the problem, regard the Bavarian system as a good model.

Most hazardous wastes *can* be treated and made, if not safe, at least much safer. Organic materials can be burned at extremely high temperatures; acids can be neutralized in combination with a base; other materials can be broken down chemically.

A treatment facility is not without environmental risks; it's just not possible to claim that emissions from its incinerator stack will always be 100 per cent pure, or that a spill of chemicals stored for later disposal will never occur.

There are other issues involved with a plant, too. Wastes have to be collected and transported to the plant — how safe is that? The management committee feels there is a need for legislation to develop suitable regulations and classification for the transport of industrial and chemical wastes.

There are questions of economics, too. Disposing of hazardous waste materials at a special plant will be more expensive than dumping in a landfill; unless they're legally obliged to do so, how many businesses would opt for the more expensive disposal method?

If it's going to work, proper waste management must be legislated. Says John Slupsky, waste management co-ordinator with Environment Canada's environmental protection service in Edmonton: "It's important to make sure, for the sake of people and the people following us now, that pollution control is a cost of doing business."

Hu Harries also feels that proper disposal of hazardous wastes should not be left to the private sector. In a privately-run waste disposal system, he says, materials that can be recycled will be removed and the "really tough ones" will be left.

The management committee also inclines toward government involvement in the system, and would favor waste management being treated as a public utility, with prices regulated by a body like the Public Utilities Board.

Then, too, *whose* wastes should be collected for disposal in a special facility? In a report on social concerns and public involvement in hazardous waste management, Dr. Natalia Krawetz of Alberta Environment's research secretariat found in reviewing cases where facilities were proposed that citizens usually object to a plant in their area if it isn't seen to be meeting a local need. "Other people's garbage" isn't welcome.

But, says Simpson, a plant dealing with regional rather than purely local wastes is more efficient and more economic — costs go down the more materials there are, in this case. He regrets the "garbage mentality" that prevents people from seeing wastes as just another product being transferred from one area to another.

Siting is one of the major problems in establishing a hazardous wastes disposal facility, mainly because, as the story about Fort Saskatchewan on Page 20 shows, public reaction is so hostile.

The "not in my back yard" syndrome is a compound of fears about health, safety, and environmental quality, as Krawetz found in her study. And those fears, say the experts, can only be allayed when people are given all the available information at an early stage, and invited to have input in planning.

A hazardous wastes disposal plant will never be a popular industry. But there does seem to be increasing evidence that it's a necessary one. Says Rob Pritchard, head of the hazardous materials section of Alberta Environment's waste management branch: "If we don't want a Love Canal, we need a plant."

It's necessary too because, as the story on Page 26 shows, we as consumers demand the sorts of goods whose manufacture *creates* hazardous wastes.

In many ways, we in Alberta are lucky. The province's industrialization is fairly recent, and we still don't have the tertiary industries which manufacture highly complex chemicals and generate extremely toxic wastes. So far, there have been no catastrophes.

In the United States, it's a different story. There, it's been estimated that a clean-up of abandoned chemical dumps like the Love Canal could cost at least $750 million.

Alberta's management committee is undertaking an intensive study of hazardous waste management; when it reports its findings, the Environment Council of Alberta will conduct public hearings across the province. As the story on Page 24 notes, there will be plenty of opportunity for public input, and plenty of sources of information.

The end of this process will be a government policy on hazardous waste management, and some action on actual waste disposal. It's a process that should yield good decisions.

Says Ken Simpson: "I think it will be done right if it's done at all."

Gillian Sniatynski is the freelance editor of this magazine.

The introduction to the December-January issue of Environment Views referred to the work of ***JOY FINLAY****, environmental outdoor education consultant for the Edmonton public school board and a pioneer in the field of environmental education in Alberta. Unfortunately a typographical error had Mrs. Finlay described as "a lone deer." She was in fact for many years, although working with support, a "lone doer." She points out that now there are hundreds of teachers working with a similar philosophy.*

What's The Problem?

A guide to some of Alberta's hazardous wastes.

WASTE TYPE	MAJOR GENERATION INDUSTRIES OR PROCESSES	EXAMPLES
Acids	Petroleum extraction and refining Textile industry Battery manufacturers Chemical industry Metal treating industry	Waste dye solutions Soluble and suspended lead wastes Pickling acids
Alkalis	Food industry Metal treating industry Chemical industry	Brewery caustic pulps Cleaning solutions
Contaminated Soil and Sand	All manufacturing industries Transportation industries	Rail car cleanout wastes
Solvents, Oils, Oil/ Solvent Mixtures	All manufacturing industries Transportation industries Petroleum and mining industries Utilities Municipal operations Laboratories	Lubricating oils Hydraulic oils Cooling oils
Pesticides	Chemical industry Application activities (municipal, agricultural, research)	Manufacturing effluents, tars, residues Banned stocks Empty container residues
Sludges	All manufacturing industries Petroleum industry	Pentachlorophenol sludge Oily sludges Heavy metal sludges
Pathological Wastes	Hospitals Medical and research laboratories	Infectious tissues, bandages Discarded specimens
Heavy Metal Solutions	Electroplating industries Metal treating Textile industry Plate engraving	Waste plating solutions Dye solutions Plate making solutions
Inks	Chemical manufacturing Printing operations	Manufacturing residues Ink wastes
Polychlorinated Biphenyls (PCBs)	Manufacturing industries Utilities	Transformer coolant fluids Out of service capacitors Soils and adsorphants contaminated by spills
Photographic Processing	Photo processors Printing industry Hospitals and research labs	Waste photographic processing solutions
Aqueous Chemical Wastes	Textile industry Chemical industry Manufacturing industries	Dye wastes Chemical sludges Metal plating and treating wastes Waste chemicals Process equipment rinses and cleaning wastes Reject chemical products
Hydrocarbon Chemical Wastes	Petroleum production Chemical industry	Pipeline pigging wastes Chemical blending wastes
Solid Chemical Wastes	Chemical industry Manufacturing industries Laboratories	Waste chemicals Chemical sludges

This information comes from a December, 1979, report on the economics of special waste management by Hu Harries and Associates Ltd.

Sharon Adams

Burial Or Barter

Deep dry holes may be the bane of energy companies searching for gas and oil in Alberta. But for industries with complex chemical and other wastes to get rid of, they may be the answer to a tricky disposal problem.

The province sits on a very thick sedimentary basin. In many places it's made up of sandstone or limestone porous enough to retain injected liquids, and stable enough to make that retention relatively permanent.

When a disposal well is drilled — it might be anything from 500 to 2,500 metres, depending on an area's geological formation — hazardous chemicals or other hard-to-dispose-of materials, in solution in water, are sent to the bottom and released.

Sometimes the wastes are simply dropped, with gravity the only force in operation. Sometimes well head pressure is needed to pump the materials down the hole.

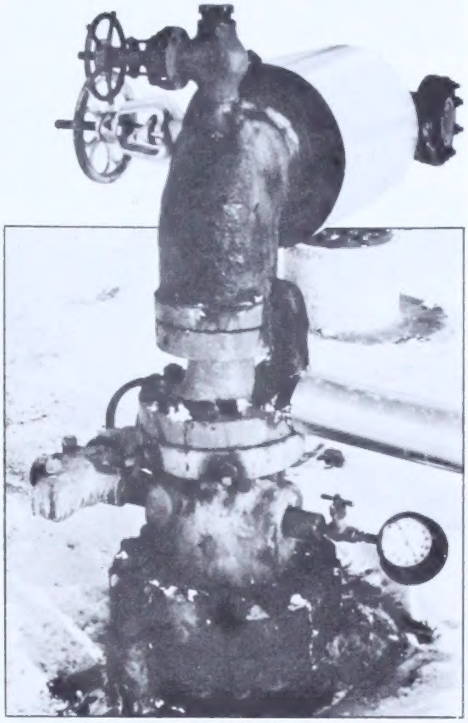
Lloyd Hicklin, whose duties with the Energy Resources Conservation Board include licensing well drilling, says deep well disposal could be the best alternative for removing potentially harmful wastes from man's immediate environment.

He explains that the same geology which allows petroleum deposits to remain trapped for millions of years should also entomb wastes for long periods. But currently only a handful of industries is using this disposal method.

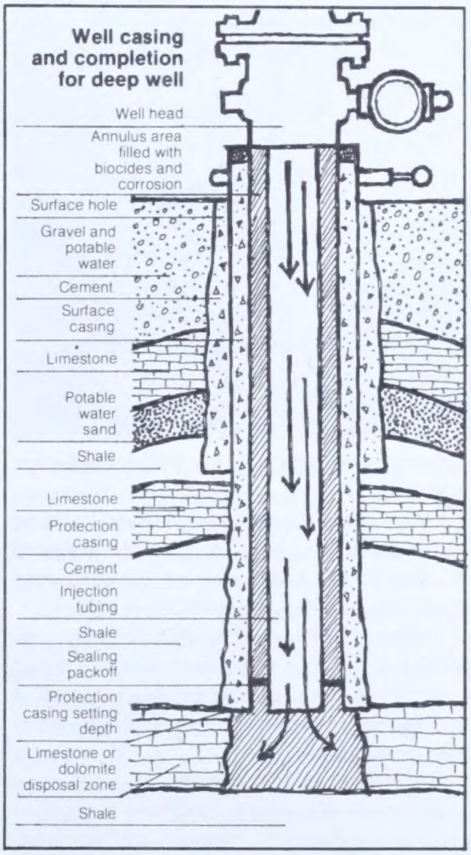
Energy companies more or less pioneered the method, Hicklin says; the material they unearth in their energy search is "just as hazardous as other substances" produced by industry, and includes gas-entrained water, brine and sour gas. The companies send the wastes back down the hole.

Hicklin estimates there are about 450 such oil field disposal wells, but only about 15 in use by other industry.

Barring a "violent, deep earthquake" (Alberta and the parts of British Columbia and Saskatchewan ideal for this type of disposal are in a low-risk earthquake zone), he says the chances are "anything you put down (one of the wells) could remain for millions of years."



Not much else is available for our hazardous wastes.



Deep well disposal has another advantage, he says: as the wastes mingle with subterranean water (also trapped beneath sedimentary deposits), they are diluted, reducing the risk should any violent event thrust them back to the surface.

Ken Simpson, head of Alberta Environment's waste management branch, says deep well disposal is "basically storage, not disposal" because the material injected down the well will continue to exist.

Disposal of chemical and industrial wastes, he says, is "a community problem, not just an industrial problem."

"As the province becomes more industrialized, as we get more sophisticated industries, we'll get more sophisticated waste."

Of particular concern now is waste from small businesses, which may not produce hazardous materials in lots large enough to make on-site disposal economic. For them, Simpson says, "the options are limited."

There is no public deep well disposal, and legislation governing disposal of hazardous wastes is only now being developed. For many small businesses, "the only alternative is the landfill site."

At garbage dumps throughout the province, hazardous materials are being dumped by the tonnes. What makes this especially alarming is that in many cases, the wastes are in liquid form; the danger is that the liquid will leach or percolate through the layers of landfill and possibly contaminate the ground water. And in most cases, there is no control over what is dumped; indeed, often nobody *knows* what is dumped.

In a unique program at Calgary's Forest Lawn landfill, however, the liquid wastes are monitored.

In 10 months in 1978 (1979 figures are still being analyzed) 437 loads of chemical wastes — some 2,700 tonnes — were dumped under 386 permits.

Gordon Zieffle, manager of sanitation for the city, says, "All landfill sites dispose of liquid wastes; the only thing extra we do is monitor the wastes to know what's going in."

Andrew Vaughan

Knowing what is being handled allows sanitation workers to take special precautions. For instance, extra care is taken when flammable liquids are being handled, or when caustic materials come in. And the hazardous wastes are handled separately from the regular fare of the landfill site —the household waste, bags of garbage, boxes, furniture, clothing, bottles and cans.

"We want to make sure there are no long-term effects," says Zieffle. "We try to neutralize certain chemicals." With the help of the University of Calgary campus safety officer and Alberta Environment, often substances arriving at the landfill site can be neutralized before being handled.

Zieffle says customers, who have to pay a surcharge for the service and list materials being disposed of before receiving a permit, represent "a total cross-section of industry . . . we even get some hospital wastes that have to be handled in a special way." Other materials include oil, battery acid, caustic materials and other chemicals.

The monitoring is done to ensure that chemicals don't leach into the ground water — even though the landfill site is located on a formation of clay so water-impervious it's used in dam construction.

It's a voluntary program which Calgary carries out from a sense of responsibility, Zieffle says.

"It's the only way to run a landfill site.

"We feel we're responsible to the people using the site (the public). The first responsible step is to monitor what's going in and the next step is to handle the wastes accordingly, now that you know what you're getting."

One way to eliminate some unnecessary landfill dumping is to redeem the waste by finding other uses for it.

In a move reminiscent of the "get some cash for your trash" drives which collected aluminum and other materials for the war effort during the Second World War, some Alberta businesses are co-operating in a scheme which allows them to turn waste produce into profit.

The Canadian Waste Materials Exchange publishes a monthly list of waste products produced or wanted across Canada. So an interested British Columbia businessman needing silver for his industrial process might link up with an Alberta photographic processor whose waste includes extractable silver.

Dr. R.G.W. Laughlin, director of the exchange, says 5,900 companies have listed 1,141 wastes, of which 151, or 13.2 per cent, were sold or bartered. This represents 85,500 tonnes of waste with an estimated replacement value of $3.7 million.

Alberta, he says, is a "fairly major contributor," and there have been 200 inquiries for the 60 waste materials listed for this province. Seven of those listings "have found new homes with a number of companies across the country." Between 300 and 400 Alberta companies receive the exchange bulletin.

"We've demonstrated this is a useful and viable program," says Laughlin. (Interested businesses can inquire about the exchange by contacting him at 416-822-4111.)

Although sponsored by the federal government for the past two years, the exchange is working towards self-sufficiency and is seeking annual contributions of $20 from user companies.

But some products, nobody wants.

Alberta's industries produce some by-products — notably phenols mainly from the petrochemical industry and polychlorinated biphenyls (PCBs) from electrical transformers and capacitators being phased out — which are non-biodegradable, suspected carcinogens, and difficult or very expensive to dispose of.

Simpson says a "minor portion" of Alberta's PCBs have been shipped east or to the United States for disposal. But an estimated 96,000 litres of PCB-laden liquids are being stored throughout the province by electrical companies whose transformers and capacitators now use safer ingredients.

Although some would argue PCBs are ideal candidates for deep well disposal, Simpson says the "only safe method of disposal is burning . . . and it would take several years to build a suitable disposal plant even if plans were in place today."

Until incinerators are available, the PCBs will be stored under tight security — an industrial version of perpetual care.

The alternatives for safe waste disposal are few, and abuses do occur. Companies surreptitiously dump toxic wastes into a river or creek, or over a bank and out of sight. But the legal alternative is not much better when hazardous chemicals are taken to a landfill site and plowed under, along with the kitchen garbage . . .

Sharon Adams is a journalist in Calgary.

Maryhelen Vicars

Pouring Their Troubles Away

Scores of small businesses dump liquid wastes straight into the landfill.

All day long, the tanker trucks roll into the massive landfill site, open their valves and spew out thousands of litres of mucky waste water.

What's in these mobile waste buckets?

Sometimes liquid wastes are carried to the dump rather than being released into the sewage system because they're full of mud and sand and would clog the sewers. Other wastes contain potentially hazardous substances like heavy metals, acids or caustic chemicals.

The tanker trucks which can be seen pouring out their troubles at any large urban landfill site are carrying the contents of industrial holding tanks, transferred to the trucks by means of a vacuum suction hose.

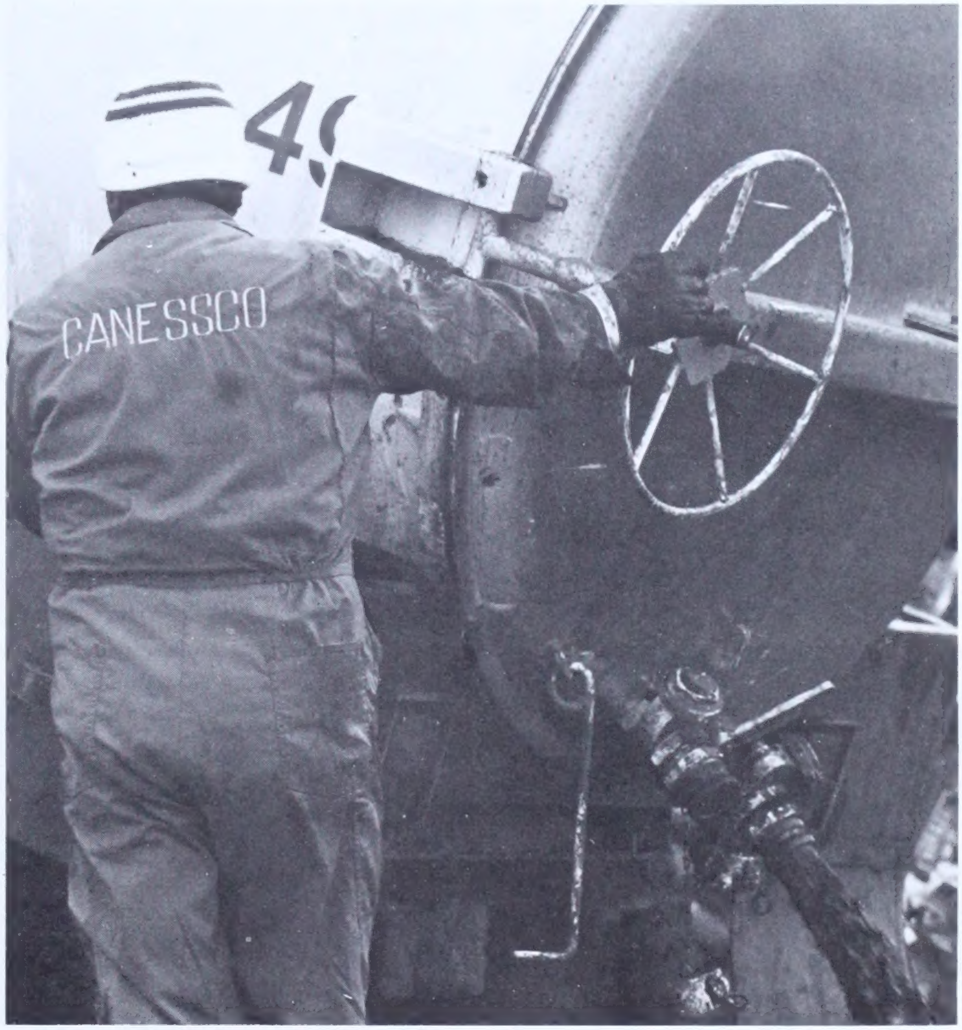
What is the source of these liquid wastes? A tour through the (mythical) Eastwood Industrial Park on the edge of a large Alberta city could provide some answers. Much of the information for this mythical tour comes from the Edmonton liquid waste survey of 1979 conducted by the pollution control division of Alberta Environment.

On a busy Saturday, as many as a dozen cars and trucks an hour go through the Kwik-Klean Car Wash. They're doused with hot soapy water and given a couple of clear rinses, and maybe a coating of wax solution.

The water which flows into the settling tanks below the floors of the washing area is carrying detergent, wax, road salt and a lot of dirt.

The sand and mud settles to the bottom of the tank. The relatively clean water at the top of the tank is allowed to overflow into the sewage system where it is carried to the municipal water treatment plant.

Rob Pritchard, head of the hazardous materials section of Alberta Environment's waste management branch, says the main problem posed by this kind of waste is that of any waste with a high water content. Deposited in a landfill site, the liquid tends to percolate or "leach" through the garbage — which could include some highly toxic contaminants — and may eventually find its way to a source of drinking or irrigation water.



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Occasionally the car wash's holding tanks may hold more hazardous material — if a farmer washes out a truck used to haul fertilizer or pesticides, for example, any spilled chemical is washed into the tank.

The BJ Barrel plant is another kind of clean-up operation. It collects used 45-gallon drums from other industrial operations and cleans them for re-use.

The barrels are scrubbed clean with a mixture of hot water, solvents and caustic cleaners.

Most of the barrels contained motor oil or fuels; a few contained industrial chemicals. BJ's holding tanks allow the waste to settle to the bottom while the cleaner water is diverted to the sewer system.

Acetyl-Alta is a small manufacturer of acetylene gas. The process involves reacting lime with water and collecting in tanks the acetylene gas which bubbles off.

Its waste product is a slurry or thin mud of water and calcium hydroxide, the by-product of the process. It's murky, but not a dangerous pollutant. Pritchard says the main reason this waste is collected rather than being allowed to wash into the sewer system is its alkalinity: the slurry could

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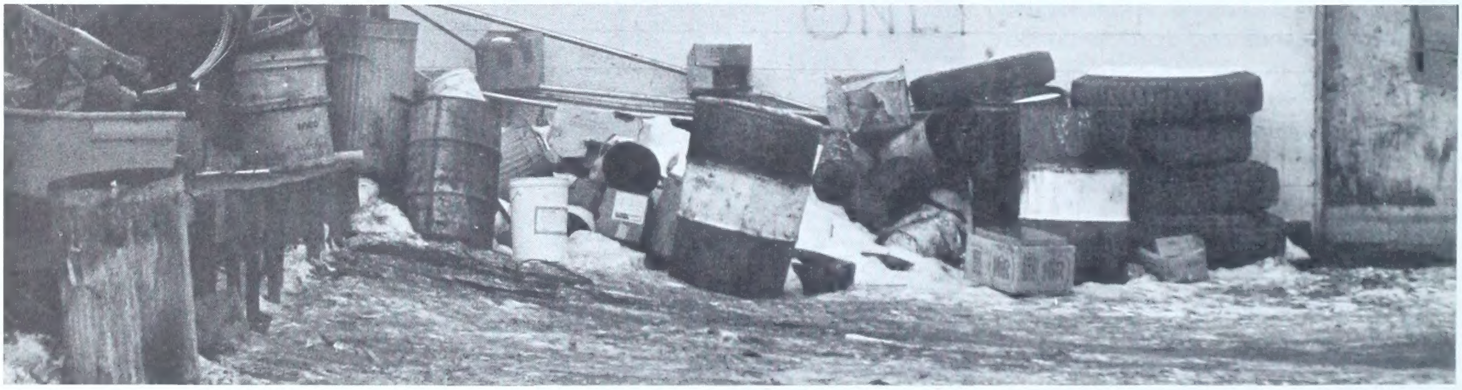


upset the acid-alkaline balance required for the survival of the bacteria which break down the sewage at the municipal treatment plant.

Acme Rendering salvages the inedible by-products of small meat-packing and poultry-processing plants which don't have their own rendering operations.

The material is cooked in a tank of hot water and the fats and grease skimmed off to be used for lard and cosmetics. Bones are collected to be turned into bone meal.

Unrenderable material such as sand, dirt, particles of meat and bone chips settle in holding tanks and are taken to the landfill.

Acme also collects blood from the packing plants. Some rendering operations have the equipment to turn the blood into a feed supplement, but Acme just disposes of it with its other wastes.

Blood and other organic wastes must be kept from water supply because of what is called their high Biological Oxygen Demand (BOD).

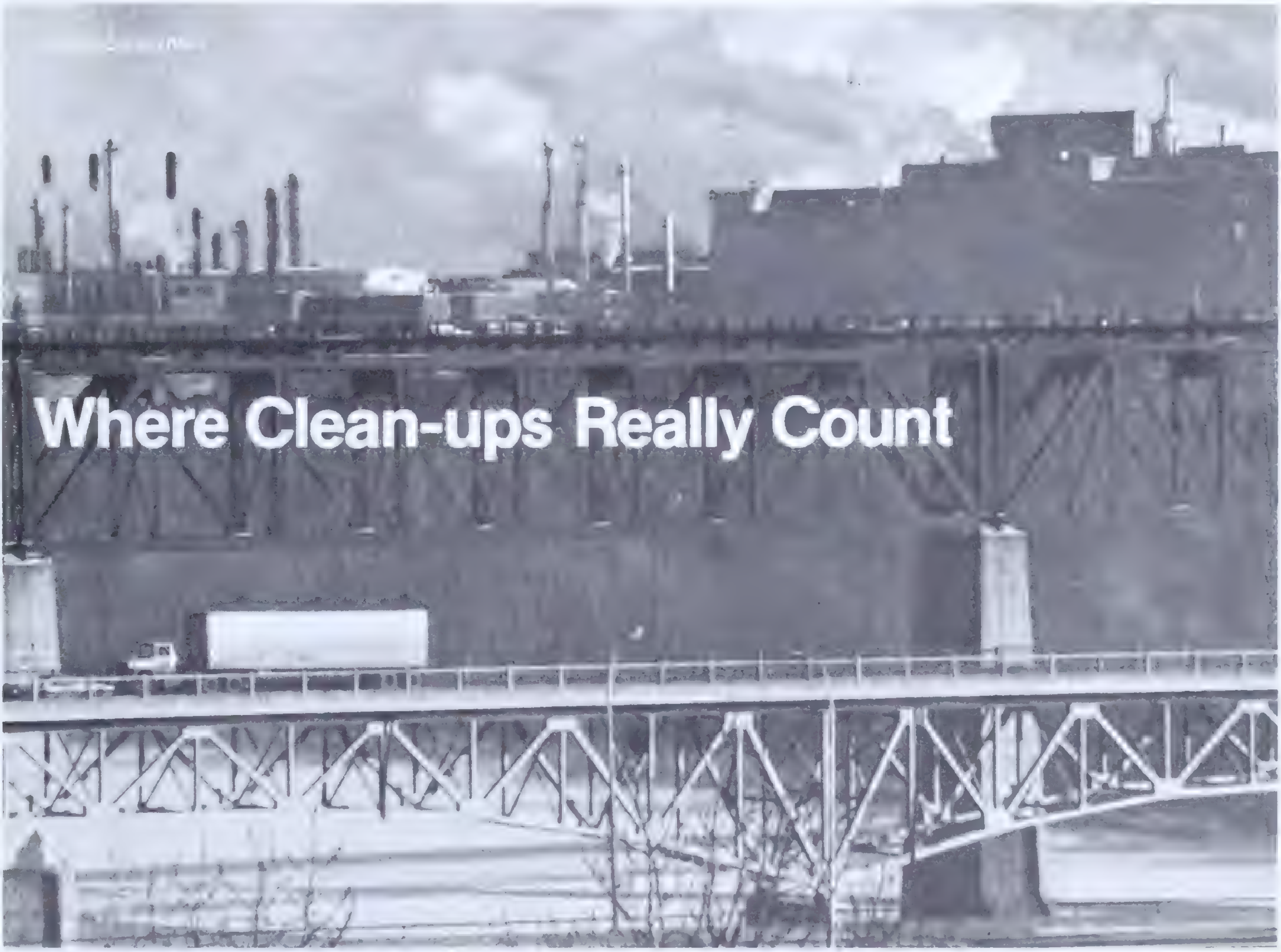
Pritchard explains: "When material with a high BOD rots it takes up a lot of oxygen in the process." This means basically that animals in the water suffocate.

The Kwik-Klean Car Wash, BJ Barrel, Acetyl-Alta and Acme Rendering are mythical. But there are businesses just like them in urban industrial areas across the province. And they're only a sample of the scores of smaller firms — from battery shops to plating shops to photographic processors to chemical manufacturers — whose wastes are disposed of in the same way.

Small wonder there's increasing concern about what goes into the landfill.

Maryhelen Vicars is a journalist in Edmonton.

Where Clean-ups Really Count



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There are more bouquets than brickbats for big industry.

One of the trout maintained at the water treatment plant at Imperial Oil's Strathcona refinery in Edmonton died recently — but not because there was anything seriously wrong with the water.

The trout, used in in-house fish toxicity tests to check water quality, was the victim of an accident — someone cut off the oxygen supply in the water.

But until its untimely end, the trout had been swimming for six months in undiluted refinery discharge.

Environmental adviser Paul Knettig sees that as an indication that, in spite of its complexity of operations and its enormous throughput, the refinery runs cleanly and produces few harmful wastes.

I've had it with this garbage...I'm moving to the Imperial Oil water treatment plant.

He estimates that a chain of tanker trucks some 20 kilometres long would be needed to carry the daily production of feedstock. But the wastes from that production mainly salty water — would fill only 50 or so trucks. And that waste is processed and disposed of entirely on the refinery property.

The crude oil that comes into the refinery is rather dirty stuff; along with the oil it contains sand, water, salt and sulphur.

It goes first to a desalter, where the salts are removed in the form of a liquid brine. This is injected into a deep disposal well on the property.

Refinery process water goes to a separator. There the oil it has picked up is skimmed off the top and injected back into the system with the fresh crude. The water which fills the middle of the separator is taken for purification to the water treatment facility (home of the trout already mentioned.)

The heavy sediment which settles at the bottom of the separator is emptied every year or two, and spread on refinery land, where, with the help of some discing to work it into the soil a little, and the action of naturally occurring micro-organisms, it degrades.

The heart of the refinery operation is the catalytic cracking unit, which begins the work of breaking down the heavy crude into other petrochemical products. In this process, sulphur is removed, most in a form which can be treated later in the sulphur plant and converted to saleable yellow sulphur solids. There is, however, a residue of sour water — water which contains a form of sulphur. This is injected down a second deep disposal well.

At the water treatment facility, water from the separator goes into aerated lagoons, where micro-organisms get to work on the impurities which still remain. From the lagoons, the water is pumped to settling ponds, where the micro-organisms settle on the bottom as biomass. The purified water is released into the North Saskatchewan River (and, says Knettig, monitored

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Part of the water treatment facility at the Strathcona refinery (left).
Sherritt Gordon Mines Ltd. (below)

Lauren Dale

constantly.) The biological sludge at the bottom of the settling ponds is cleaned out every couple of years and used, like the separator sludge, as a land spreader.

"We are a big waste generator," says Knettig. "But if I compare what our throughput is, we are probably a thousand times more efficient than any household in Edmonton."

Sherritt Gordon Mines Ltd. operates a fertilizer and base metal (nickel) refining plant near Fort Saskatchewan. Its major products include ammonia, hydrogen, urea, sulphuric acid, granulated phosphate, phosphoric acid, ammonium sulphate, nickel, cobalt and copper in copper sulphide.

According to Sherritt's head of environment, Paul Kawulka, there are two major waste products from all these operations.

Part of the fertilizer production makes use of phosphate rock, which contains uranium. The rock is ground up and treated with sulphuric acid, to form phosphoric acid and gypsum. The phosphoric acid is then used in further processes in the fertilizer production; the gypsum is the waste.

Because it possess a low level of radioactivity (from the uranium in the original rock) the gypsum is stored in ponds on the plant site. Eventually the water is drained off and returned to use at the plant, while the gypsum piles up. Kawulka says grass is planted on the piles, and they become "a bit of the landscape."

The other major waste comes from the nickel-refining process. Another pond on the site collects iron tailings which are, again, subsequently drained of water and allowed to collect in piles. Kawulka says some of the tailings are sold to industry.

Sherritt draws fresh water from the North Saskatchewan River which it uses, along with processed water from other sources in the plant, for its manufacturing and refining processes. Liquid effluent is then returned to the river. The effluent is subject to routine compliance monitoring, and contaminant levels must not exceed those specified by the provincial board of health.

During 1976 and 1977, however, the water quality control branch of Alberta Environment's pollution control division also monitored discharge points from the plant in the creek which runs through the plant site, and discovered that some highly toxic chemical wastes from the fertilizer plant had washed into the creek. According to Kawulka, the contaminants had likely been picked up in storm water run-off from the plant.

Under the terms of Sherritt's current licence to operate, discharge points in the creek (which runs into the North Saskatchewan River) must be regularly monitored; findings will be reviewed in June when the licence is due for renewal.

If the monitoring shows continued contamination of the creek by Sherritt operations, steps will be initiated then to correct the problem.

"If it's significant we'll do something about it," says Kawulka.

Two deep disposal wells, plus the technology to recycle chemicals, take care of hazardous waste disposal problems for Dow Chemical of Canada Limited at its Fort Saskatchewan site.

There are several plants on the site: one produces vinyl chloride monimer, used to make polyvinylchloride or PVC; the ethylene oxide products plant produces, among other things, ethylene glycol used in antifreeze; the herbicide plant's products include the weed-killer 2,4-D; the chlor-alkali plant makes chlorine, hydrochloric acid, caustic soda and salt; the Styrofoam plant produces Styrofoam-brand plastic insulation.

From all this, the major wastes are salt solutions, which are injected in the deep wells. A third of the total comes from the herbicide plant; this stream could be expected to contain some toxic chemicals too, but, says Don Pridy of Alberta Environment's standards and approvals division, these would be in "tiny" concentrations.

Most of the chemicals which get into the waste streams are recycled for further use; that's partly, at least, because they're much too expensive to throw away.

Says Dow public relations officer Gordon Butte: "Generally anything that we do (related to waste disposal) is conducted within the guidelines suggested by Alberta Environment. Our objective is to be better than that."

Jannie Stafford Edwards

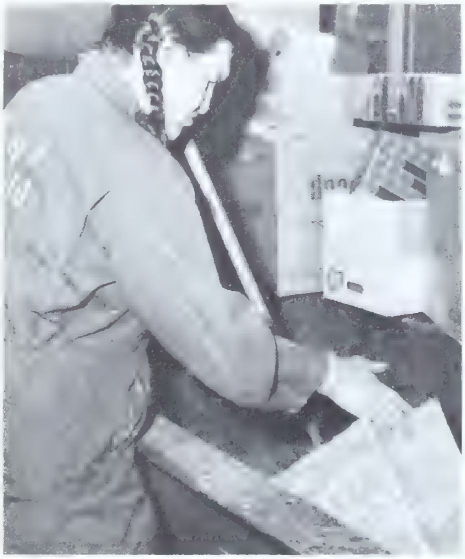
Lauren Dale

Hospital and research laboratory wastes may be

A Hazard To Health

There's a lot of talk these days about the gross national product. And it's not only the economists and politicians who are talking; the safe disposal of perhaps our grossest national product – garbage — has become a growing concern in those traditional Kingdoms of Clean —hospitals and research centres.

What happens to all those dressings, needles, pads, human and animal tissues, and all the other discards from nursing stations, isolation areas, operating rooms and labs? Pathogenic (disease-causing) bacteria and viruses can be present in hospital wastes in sufficient numbers to be a serious health risk. Contaminated hospital wastes along with ordinary uncontaminated garbage from large urban hospitals can add up to 4.5 kilograms per day per bed. For a complex the size of the Royal Alexandra Hospital in Edmonton, this means about 9,000 kilograms of solid waste is generated daily, about six per cent of it hazardous.



Alberta Environment, concerned about the public health factor involved in transporting potentially hazardous hospital wastes through populated areas to landfill sites, commissioned a survey of solid waste handling and disposal in all Alberta hospitals early in 1975. The study found that few hospitals were following guidelines put forward by the provincial board of health regarding contaminated wastes.

A major part of the problem lay in the hospitals' interpretation of what actually constituted contaminated waste: special care was taken in the disposal of wastes from operation and isolation areas, and from pathological laboratories, but wastes less obviously contaminated, such as needles or disposable dressings soiled by respiratory, wound or oral secretions, were found not to be consistently monitored. Often, these wastes were moved through the same areas as food or sterile items — sometimes on the same vehicles.

"What prompted the study was the realization that some of the larger urban hospitals were sending all their untreated solid wastes to sanitary landfill sites," says Ted Malach, an engineer with Alberta Hospitals and Medical Care.

Other hospitals were found to have woefully inadequate incinerator facilities, with emissions beyond Alberta Environment standards.

Some of the small rural hospitals had only burning barrels. Often, the damp hospital waste was not fully incinerated; the remaining refuse was taken to the town dump where kids and dogs could get hold of infected dressings. Ground water pollution due to run-off or infiltration at the landfill sites was also a major concern.

The study recommended that all hospitals in the province employ on-site incineration to dispose of solid wastes. Al Matthews, another Alberta Hospitals and Medical Care engineer, estimates that 55 rural hospitals will have had new gas-fired, high-temperature incinerators installed by the end of the year, and work is under way to upgrade or replace existing incinerator facilities at the urban hospitals.

Not happy with the incinerators available on the Canadian market, Matthews has gone to the United States to find gas-fired, controlled-air incinerators capable of burning up to 450 kilograms of solid wastes per hour at temperatures of up to 1,200 deg. C.

With fuel costs escalating, it has become economically feasible for the larger incinerator units to be equipped with heat recovery systems. The incinerator under construction at the Royal Alexandra Hospital, for example, has a heat recovery system that will generate enough hot water to supply the hospital's entire laundry facility needs. Such high-powered technology doesn't come cheap: Matthews estimates that the average cost of such an incinerator will run to about $750,000. Experts estimate, however, that the heat recovery systems of these units will take only three years to pay for themselves.

The American incinerators, says Matthews, meet emission controls set forth by the American Veteran Hospitals Act: "a very stringent regulation" that sets much higher emission control standards than does Alberta

[illegible]

From cardboard cartons to contaminated dressings, the University of Alberta Hospital incinerator copes with all the hospital's solid wastes (left)
The U of A chemical solvent disposal plant near Ellerslie (below and on following page)

Environment, according to Matthews. "Hospitals may as well lead the way in raising acceptable emission standards," he says.

Although most of the province's hospitals have had or are in the process of having their incinerator facilities upgraded or replaced, the University of Alberta Hospital in Edmonton is in a "crucial situation," according to Al Mohler, director of the hospital's physical plant. The hospital complex is still using its old incinerator but the new multi-million dollar health sciences complex will soon encroach on it.

The U of A Hospital incinerator currently serves as the sole incinerator for all of the hospital's solid wastes — both pathogenic and non-pathogenic. Officially, pathogenic wastes from the W.W. Cross Cancer Institute, the Veterans' Nursing Home and the Aberhart Hospital also come to the incinerator at the U of A Hospital; however, there appears to be no official collection system for these wastes.

The research boom in the province funded by the healthy Heritage Savings Trust Fund has compounded the problem of disposal of hazardous wastes from reaserch labs. Ted McCourtney, administrator of the W.W. Cross Cancer Institute, says that he's had to juggle space there to create more research labs, and that has involved taking out storage and washroom space. The amount of solid and chemical solvent wastes from the institute has increased by four per cent since 1975, there's more use of mice and rats in the research labs, but there are still no comprehensive incinerator facilities. On-site incineration "just wouldn't pay," says McCourtney. A private concern picks up most of the solid wastes from the institute and takes them to a sanitary landfill site.

A study completed in July, 1979, investigated the feasibility of a centralized incinerator system that would serve the University of Alberta Hospital, its related facilities and the greater campus area of the University of Alberta. The proposed system would likely be located adjacent to the university heating plant to facilitate heat recovery into the existing steam distribution system. But time is running out for the hospital, says Al Mohler. Once the old incinerator goes, Mohler is unsure whether Alberta Environment guidelines will permit the hospital to send its solid wastes to a landfill site.

Stan Ostapowich, physical plant engineer for the University of Alberta campus, adds a note of caution to the optimism

Andrew Vaughan

concerning the safe incineration of solid wastes. "Any time you start incinerating solid material, you wind up having plastic hydrocarbon material that is either chlorinated or nitrated," he says. "Either way, gases are released into the air that should not be released."

"Scrubbing" the gases before they are released to the atmosphere would solve this problem, he says. In the scrubbing process, a hydrochlorinated carbon compound would be broken down into carbon dioxide, water and hydrochloric acid. Once broken down, the gas is made less flammable and can be more safely disposed of.

Ostapowich has been involved since 1976 in setting up a chemical solvent disposal plant at Ellerslie, near Edmonton. The plant disposes of all chemical solvents produced in labs and research centres in the University of Alberta campus and hospital complex. All chemical solvent wastes sent to the plant are subjected to standardized handling procedures that identify the waste and the person who originated it. The flammability, health risk and reactivity or stability of the material must also be rated on a code of zero to four. This way, problems can be traced back to their source.

What happens to the chemical solvents at the Ellerslie plant? Heavy metals such as mercury, cadmium, lead and chromium are reclaimed and recycled. The solvents are burned at high temperatures and the resulting gases are scrubbed before being released into the atmosphere. Polychlorinated biphenyls (PCBs) are sold to disposal outfits. Ostapowich says the Ellerslie plant is the only facility of its kind in the province that he's aware of.

The problems identified in the 1975 Alberta Environment study on the disposal of hazardous wastes from hospitals are still with us. The trend towards increased use of disposable items in hospitals and research centres continues, making the job of safe waste disposal more challenging. On the positive side, advances have been made to safeguard the public against the risk from pathogenic wastes from these centres. Alberta Hospitals and Medical Care has made a solid commitment to finance on-site incinerators for hospitals.

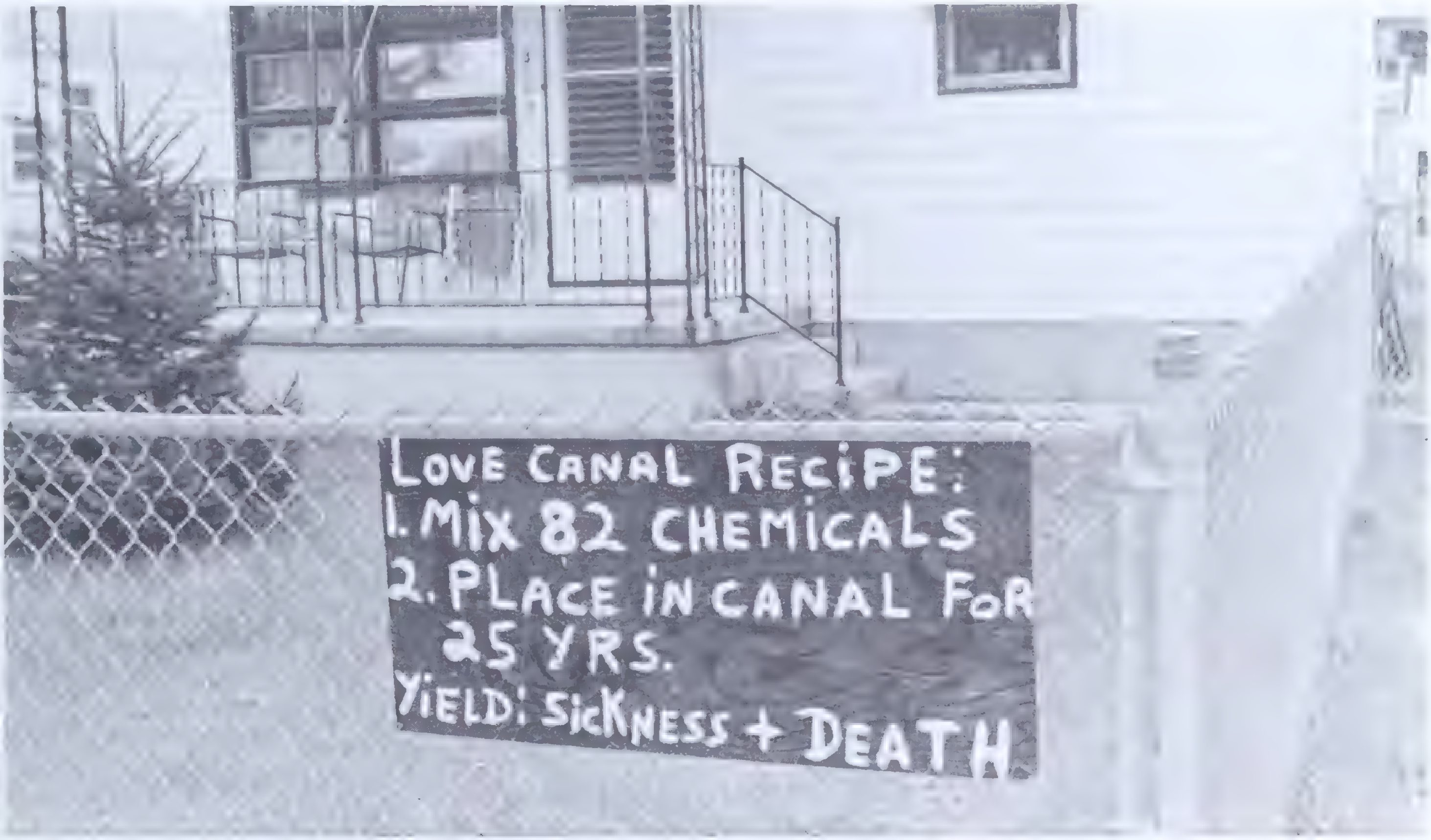
According to Al Mohler, what we need now is "more solid guidelines and monitoring practices from the environment and health authorities to keep the public health risks as low as possible."

Jannie Stafford Edwards is a freelance writer living in Edmonton.

Donald McMann

The Opposite Ends Of The Scale

Two dramatically different approaches to the problem of hazardous waste disposal.



The Niagara Gazette

Highly toxic chemicals dumped in a makeshift burial ground — around which houses and a school have been constructed.

A modern, sophisticated hazardous waste treatment system which includes disposal plants, laboratories, collection mechanisms, specially constructed landfill site; the whole stringently regulated to make mishaps almost impossible.

Those are the situations discussed here; they represent extreme, opposite solutions to the problem of hazardous waste management.

The Love Canal was intended as the start of an inland waterway conceived by an American businessman, W.T. Love, in the late nineteenth century. Love had envisioned a project which would provide a transportation corridor around the Niagara Falls and a generous supply of hydro-electric power to the region as well. But Love ran out of money after a ditch 1.6 kilometres long, 18 metres wide, and from three to 12 metres deep had been dug. The project was abandoned and the site later sold to the Hooker Chemicals and Plastics Corporation of Niagara Falls, New York.

Hooker had its own plans for the site. The company, a producer of pesticides, plastics and caustic soda among other things, used the "canal" as a dump for its chemical wastes from the early '40s to the early '50s.

Michael H. Brown, a former reporter for the Niagara Gazette, and a keen investigator of the chemical dump and its effects, writes in a recent edition of Atlantic Magazine that some 18,000 tonnes of wastes from Hooker operations were dumped during the period.

Because the canal had been dug in heavy clay, there was no immediate danger of a chemical leak to the surrounding soil. And Hooker claimed to have placed a clay seal over the top of the dump. But these were insufficient precautions for what was, in Brown's terms, a site "simply unfit as a container for hazardous substances, poor even by the standards of the day."

The final act of a modern-day tragedy began when Hooker in 1953 deeded the dump site to the Niagara Falls board of education. The board decided to build a school on the site to accommodate the children from a rapidly expanding residential area nearby. All the construction activity apparently broke through the trench's inadequate cover.

The Love Canal was now open to the elements. As precipitation entered the dump it overflowed, draining into adjacent permeable soils, and then through old creek beds. Soon chemicals in ground water flooded backyards, sumps in homes throughout the area were filled with pungent chemicals, and the trees and lawns of homes closest to the canal began to die. Area residents, whose homes were now smelling strongly of fumes, began suffering a variety of ailments including headaches, respiratory problems, ear infections, and general feelings of irritability and fatigue. Worse still, the rate of miscarriages in the neighborhood was reported to be 50 per cent higher than the U.S. national average.

As time went on, even more disturbing evidence of the effect of the chemicals on the health of the area's residents was found. Brown reports that the incidence of cancer and birth defects was high, and that "traffic signs warned passing motorists to watch for deaf children playing near the road."

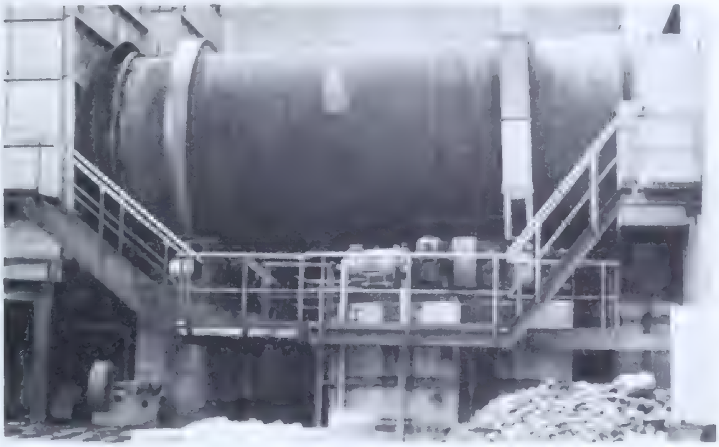
It was not until 1978 that the full extent of the problem was admitted, and President Carter declared the site a national emergency. And even this occurred only after the frantic efforts of local residents and pressure from the media. Tests had revealed that the dump contained, among other poisons: polychlorinated biphenyls or PCBs, known to cause liver damage and suspected of causing cancer; the carcinogenic substance benzene; and dioxin, so toxic that, reports Brown, three ounces (84 grams) could kill a million people.

State and national governments bought about 500 homes nearest the canal so that those in greatest peril could permanently relocate. Others were moved temporarily until a drainage system could be installed to collect and treat contaminated groundwater. Once this was done, a new clay mound was to be placed over the canal.

Brown writes of new fears now that the contamination from the canal has spread well beyond the official evacuation area. But residents temporarily evacuated will have to return home, unless lawsuits aimed at permanent relocation are successful. The nightmare for many is not over.

In the German state of Bavaria hazardous waste disposal is handled differently. The entire state manages its wastes through a firm called the Gesellschaft zur Beseitigung von Sondermull (GSB) or Bavarian Chemical Waste Treatment Company. Owned 40 per cent by the Bavarian state government, 30 per cent by the municipalities, and 30 per cent by a collection of 53 industrial companies, it serves 6,000 industrial customers. The area contains some 11 million people and is about one-tenth the size of Alberta. GSB runs and finances three incineration plants, two chemical physical treatment plants, two chemical landfill sites, and nine transfer stations. It gets its funds by charging the costs of treatment to the companies which generate the waste.

"Industrial generators will deliver their waste to one of the transfer stations and



Aerial view of the Love Canal, with the Niagara River in the foreground (far left) GSB incinerator at Ebenhausen (left) Chemical landfill at Gellenbach, drum storage yard at Ebenhausen (below, left). Ebenhausen plant's solvent storage facility (below).

then GSB will truck it themselves — or by approved independent truckers — to the nearest treatment facility," says Rob Pritchard, head of the hazardous materials section of Alberta Environment's waste management branch, who toured GSB last year.

"GSB treates the waste, calculates how much it costs to do it, and tells the customer how much he owes."

There is a price list for common kinds of waste, so industries or plants know in advance how much the treatment will cost. For uncommon material, GSB conducts laboratory experiments in order to determine the best means of treatment. Then the waste, which has been stored in secure conditions, is treated and the customer billed. "It doesn't matter how much it costs, the generator of the waste pays for its treatment."

The German system provides incentives for efficiency. Before the waste treatment program, many companies just dumped materials in landfill sites at no cost at all. The new system, by charging significant fees, forces them to look for new processes, new raw materials, innovative recovery systems, or anything else which would diminish the amount of waste to be treated.

The newest and most advanced of Bavaria's facilities is a treatment plant at Ebenhausen. Covering some 40,000 square metres it has three parts. The first is a general area housing the elaborate laboratories and administration offices. The second is the chemical-physical treatment section which treats inorganic substances like used acids, cyanides, nitrites, and heavy metals. Treated liquids can be discharged into the river; solids can be fed either to the incinerating plant or landfill site. The third section of the facility is the incineration plant in which all substances containing organic matter are burned.

This plant has the newest equipment. Scrubbers have been installed to clean all the gases which leave the stack. There is even provision for heat recovery so that electric power becomes a by-product of the process.

GSB also has two landfill sites specially designed for chemical wastes.

The Bavarian chemical landfills are no ordinary ones, says Pritchard. They are located in impermeable clay and, for extra safety against seepage, are lined with heavy-gauge (2.5 mm) plastic. Under all the waste, piping has been installed, to collect any moisture that may seep into the ground water. Liquid from the pipes is collected in a leaching pond, pumped into tank trucks, and taken back to the treatment plant.

Donald McMann is a journalist in Edmonton

Susan Mayse

'Not In My Back Yard!'

That sums up the feeling in Fort Saskatchewan about a hazardous wastes disposal plant.

Lauren Dale

Dr. Geoff Marsh

Gerry Gerke

Muriel Abdurhaman

Spring 1979: Kinetic Contaminants Canada Limited informally approached Alberta Environment to consider the need for a disposal plant for hazardous wastes in Western Canada on the basis of a 1972 study recommending this. Company president Gerry Gerke was told an environmental impact study would be required for the chosen site, to outline possible environmental and social effects.

June 18: During a confidential business meeting of the Fort Saskatchewan town council, members learned of Kinetic Contaminants' proposal to build at an unspecified site in the area. Town administrators circulated a single confidential copy of information, not available to the public.

June 19: Town councillor Muriel Abdurhaman read available information on hazardous wastes with concern. Hazardous byproducts would travel by rail through the town centre: what would happen in case of derailment? Would a plant accident set off a series of reactions in the town's many chemical plants? What was the extent and source of Kinetic Contaminants' funding, and would it cover mishap?

Week of June 25: Grant Notley (NDP, Spirit River) asked Alberta Environment Minister Jack Cookson in the legislature about the proposal. Cookson said he would supply information.

July 9: At a Fort Saskatchewan town council open meeting, Kinetic Contaminants' Gerry Gerke explained his proposal, supported by his firm's consultants, and gave out information on hazardous waste management. He described the plant as in "the conceptual stage" yet hoped to turn sod in September, only three months distant.

Fort Saskatchewan optometrist Dr. Geoff Marsh, concerned about a lack of information, called an informal meeting July 19.

July 19: At a citizens' meeting, 12 people agreed they didn't want a hazardous wastes plant near their town or any town, and decided on a July 31 town meeting to make town residents aware of the situation.

Muriel Abdurhaman received numerous calls from townspeople anxious for information.

Geoff Marsh contacted chemical engineers, environmentalists and others in Canada and the United States; information on hazardous waste disposal is hard to come by, and it seems even the experts disagree on the best methods and the success rate.

July 26: Abdurhaman and Marsh met with Kinetic Contaminants representatives. Gerke told them he could not at that time provide environmental impact information. Abdurhaman, trying to locate material on Canadian standards and the history of similar plants, discovered this would be Canada's first. No standards, provincial or national, existed.

July 31: At a public meeting expected to draw 60 people, 300 arrived to demand more information on the planned facility. Concern centred on a plant's effect on present transportation and environmental difficulties, and on other town chemical plants in case of accident. Those present decided to circulate a petition and tell the provincial government of town reaction: they saw the need for such a plant, but didn't want it near Fort Saskatchewan or another town.

Aug. 31: With a 3,500-signature petition, members of the citizens' group met with Environment Minister Cookson to express their concern.

Sept. 6: Kinetic Contaminants announced a public meeting Sept. 12.

Sept. 12: About 300 people attended the public meeting to see Kinetic Contaminants' slide presentation on the proposal. Projector trouble and an offer to answer questions between slides meant only three slides were shown in two hours. The audience was emotional, hostile to a hazardous wastes disposal plant near Fort Saskatchewan. Among questions and concerns:

- a belief Kinetic Contaminants had withheld information or misled townspeople and town council;
- undisclosed background and funding of the company;
- possible bankruptcy and government takeover of the plant;

- apparent uncertainty about the disposal method to be used;
- fears about transport of dangerous substances through the town centre by rail or highway;
- effects of an accident on Fort Saskatchewan's clustered chemical plants;
- damage to or loss of farmland;
- danger of birth defects, miscarriages and other health hazards resulting from accidents in similar plants.

The meeting ended with nearly unanimous angry rejection of the proposal.

Sept. 14: Environment Minister Cookson announced formation of a six-member committee to report on hazardous waste management in the province; following this report, the Environment Council of Alberta would hold public hearings across the province. He set a moratorium on hazardous wastes disposal facilities until after the public hearings and a government decision on how hazardous wastes should be handled.

The Fort Saskatchewan citizens' group made presentations to the management committee.

Dec. 18: A Two Hills citizens' group appealed to the Fort Saskatchewan group for information and advice after Kinetic Contaminants met with members of the Two Hills Chamber of Commerce to propose a hazardous wastes disposal plant in their small town.

It was a $30 million misunderstanding. In June, 1979, Kinetic Contaminants Canada Limited, an Edmonton company, approached the Fort Saskatchewan town council with a proposal to build a hazardous wastes disposal plant nearby.

Three months later, the idea had fizzled amid angry public reaction. Kinetic Contaminants withdrew, a province-wide development ban on such plants descended, and a citizen-government committee was undertaking a study and the Environment Council of Alberta was asked to hold public hearings into the management of hazardous wastes. Meanwhile, Canada remains without a facility for the special handling of byproducts of the manufacturing and petrochemical industries.

What went wrong?

Fort Saskatchewan, about 24 kilometres northeast of Edmonton across farmland and industrial areas, has grown rapidly to its population of 10,000. The town straddles CN rail lines and is beginning to sprawl south of Highway 15 as residential districts keep pace with industrial expansion. Many Fort Saskatchewan dwellers work in the town's chemical plants: Diamond Shamrock Alberta Gas, Dow Chemical, Guardian Chemicals, Inland Chemicals, and Sherritt Gordon Mines among others. Some townspeople work in local service trades or commute to Edmonton. A great number don't work at all — children of the young town are bursting the seams of schools and kindergartens. It's a close-knit friendly community, proud of its growth and concerned about its future: a chemical town, but far from a single-company town.

The plant Gerry Gerke hoped to build 10 to 20 kilometres away would be a natural complement to the town's existing industries, he felt. Estimated at $20 to $30 million depending on the final design demanded by its site, the plant would likely consist of a modular plan housing all components under the same roof: labs, research groups, bulk and drum storage, neutralizer, incinerator, transport, administration, environment monitoring, security, safety and medical. A compartmentalized design would hopefully contain any mishap and prevent damage from spreading beyond its point of origin. A 24-hour incinerator operation and eight-hour chemical plant would mean a staff of about 120 from groundskeeper to president.

An assortment of chemical byproducts, and outdated or unlabelled chemicals would make up the bulk of the operation's business. Low-level radioactive material might be handled, but most of this material is

Fort Saskatchewan — "a close-knit friendly community proud of its growth and concerned about its future."

Lauren Dale

dealt with locally by the University of Alberta's small facility at Ellerslie, and probably would not be processed by Kinetic Contaminants. High-level radioactive wastes, requiring a separate facility, would not be handled. The plant would also process polychlorinated biphenyls (PCBs).

"The plant is a safe plant," says Gerry Gerke. "There's no reason for it not to be located in a town. Kinetic Contaminants was set up to protect the environment, not to make it hazardous."

At least, he adds, the plant is as safe as anything can reasonably be. "We want instead to minimize the chance and the effects of an accident."

Dr. Natalia Krawetz, of Alberta Environment's research secretariat and author of the report "Hazardous Waste Management: a Review of Social Concerns and Aspects of Public Involvement," underlines the caution.

"You cannot really guarantee something will be 100 per cent safe," she explains. "Hazardous wastes are a negative aspect of a positive situation. You pay a price for anything — in this case hazardous wastes are the price of technological growth."

Why was Fort Saskatchewan attractive as a site?

"We had been looking at Refinery Row in Edmonton," says Gerke. "The costs are much lower at Fort Saskatchewan," where a smaller but concentrated number of chemcal plants producing hazardous wastes operate.

Fort Saskatchewan is serviced by road and railway, and already supports a population of high-technology workers. It's near a major centre but has plenty of basic amenities on its doorstep to attract new people and keep them content once they arrive. The three sites Gerke considered, one in Strathcona County and two in Sturgeon County, are farmland not in use at present, "marginal land — but that could always be debatable." The location, like Edmonton, would not only be next door to important "waste generators" in manufacturing and petrochemical industries, but a central clearing house for other sources of hazardous wastes from B.C. to Western Ontario to the Yukon and N.W.T.

It sounds ideal, to a chemical engineer or a businessman — not to the residents of Fort Saskatchewan who protested the planned facility.

"They just seemed to think we were a little chemical town and they wouldn't even get a reaction," says Susan Derejko, who describes herself as a concerned parent and resident. "What turned us off most is that they seemed to know even less about hazardous wastes than us."

"It's folly to centralize everything," says town councillor Muriel Abdurhaman in a masterly presentation of facts and concerns. "Instead, we should be dispersing the wealth and separating these plants. I think the government should be aware of this — the safety hazard, the use of farmland, and the inequity in assessment rates."

The more industry, the better the tax base for a community, she explains, and the more favorable the residential or commercial property rates; outlying areas could use some tax benefits as well as heavily-industrialized centres.

Most community concerns, however, hung on the matters of health, safety and suspicion of Kinetic Contaminants which many

Lauren Dale

felt was holding back information.

"Safety and health are emotionally volatile issues," says Krawetz. "One thing that happens in a community like Fort Saskatchewan is that people feel they have a right to be consulted, to express concerns, to get answers."

The fears of Fort Saskatchewan people emerged painfully, step by step: in small meetings, in phone calls to distant experts and interested local people, in the two public meetings highlighted by anger and alarm.

Did Kinetic Contaminants know enough about hazardous wastes, or was their town to be a guinea pig? If the company knew, why wasn't it telling? Who was funding the project, and did they have enough money to cover liability or emergencies? With eight unprotected level crossings in the centre of Fort Saskatchewan and a highway through suburbs, what casualty toll could an accident take? Exactly how would the wastes be handled? What about the dreadful birth deformities and health damage from other hazardous chemical accidents? Why had the company failed to produce an environmental impact assessment?

In the absence of answers, the questions became steadily more fearful and accusing until they culminated in the emotional public meeting of Sept. 12. "I remember Mr. Gerke," says one still-upset resident. "And I guess he remembers me. I threatened his life if he brought that plant in here."

"I don't feel happy about the meeting," Abdurhaman says with regret. "I don't think Kinetic Contaminants had a fair hearing."

Nonetheless, the fat was in the fire. Environment Minister Cookson's announcement of a development moratorium and a hazardous wastes study seemed to mark the end of Kinetic Contaminants' interest in a Fort Saskatchewan area site.

"Of course we'll always retain some interest until a final site has been allocated," Gerke says, but he sounds half-hearted. "People were concerned about the environment — I couldn't agree more. They were asking all the same questions I had asked myself and answered."

But neither he nor his consultants conveyed the answers to the people of Fort Saskatchewan, in a belief that the information couldn't be simplified, and that use of a public relations firm would create a feeling of hostility at being manipulated. An approach to the town of Two Hills proposing a similar plant is turning into a repeat performance, Gerke says, because of a "failing of the opposing group to conduct matters in an orderly fashion."

Gerke had not seen a copy of Krawetz's report, intended to inform potential developers of hazardous waste facilities of the need for public participation.

"I believe in letting all the wash hang out," says Krawetz. "Without a public airing of information you won't get an informed public who can make a reasonable decision. I think that if informed, enough people would agree that the situation is a tradeoff."

Ken Simpson, head of Alberta Environment's waste management branch, concurs. "We're learning a lot more about this, especially the need for full disclosure of advantages and disadvantages to a town. A town has to be convinced there's something to gain, or why should it take a risk?"

"The attitude around the world is talk to everyone early," says Brian Plesuk, a community impact co-ordinator for Alberta Environment who advised both citizens' group and Kinetic Contaminants from the start on the importance of public involvement. "This is a result of not taking advice."

Meanwhile, Kinetic Contaminants' considerable technical information — a partially completed environmental impact assessment, details of the projected plant, safety precautions — languish unseen because of the company's policy. In the eyes of Fort Saskatchewan at least, the firm is akin to the irresponsible owners and managers who experienced chemical or nuclear disasters in recent years in Seveso, Italy, on the Love Canal, New York, at Three Mile Island, Pennsylvania.

"If there's one thing I really want to say," Muriel Abdurhaman sums up, "it's this: let's have a hazardous wastes disposal plant, but let's do it with proper care."

Susan Mayse is a freelance writer living in Edmonton

Joyce Gariepy

A Growth Of Involvement

The provincial government is responding to concerns about hazardous wastes.

Alberta's enviable economic growth and industrial development are a source of satisfaction to a strongly supportive provincial government.

But that government is also feeling more concern about some of the less desirable byproducts of industrial development, namely hazardous waste materials.

Disposal of those wastes had for years been an uncontrolled, haphazard affair, with municipal landfill sites absorbing the bulk of the burden.

But experimental monitoring of Edmonton's Clover Bar landfill, and problems emerging at other landfills across the province, were the first signals that all was not well. Officials became increasingly concerned about materials that were being dumped in the landfills, the location of those landfills (sometimes, as in the case of Clover Bar, quite near rivers or other water sources), and the fact that contaminants could percolate through the landfill material and reach sources of drinking water.

Andrew Vaughan

Ken Simpson

Partially in response to these problems, Alberta Environment's waste management branch was set up in 1975.

Branch head Ken Simpson notes that an attempt has been made since then to grapple with the problems of hazardous waste disposal. The branch attempts to control illegal dumping, and offers advice where it can on proper waste disposal. But its effectiveness has so far been limited; it has no legislative authority to make sure its advice is taken.

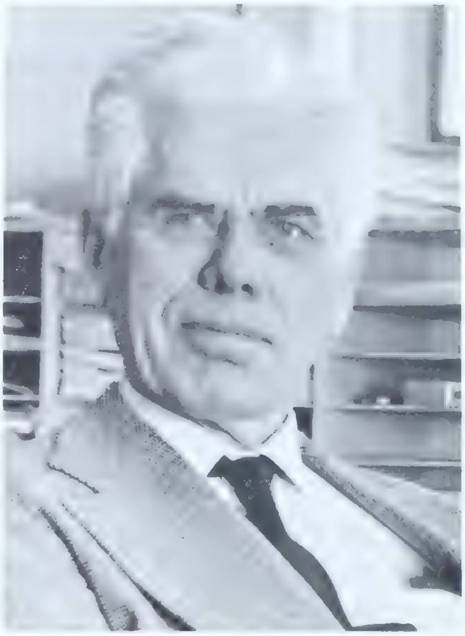
That situation may change. Government involvement in the problem of hazardous waste management has greatly increased since last fall, when Environment Minister Jack Cookson set up a citizen-government committee to study hazardous waste management.

The move to establish the committee was triggered at least partly by a proposal by Kinetic Contaminants Canada Limited to build a hazardous wastes disposal plant at Fort Saskatchewan.

Strong negative reaction to the proposal by local residents served to focus public attention on the problem, and point out the need for more information about plants in particular, and hazardous waste disposal in general.

The six-member committee, formed in September, 1979, is assessing the extent of hazardous wastes in the province, analyzing, defining and classifying such wastes, and examining current methods of waste management. The committee will also review the criteria to be used in determining the location, size and type of hazardous waste disposal facilities required, "bearing in mind," says assistant deputy minister and committee chairman Eugene Kupchanko, "it is imperative that the alternatives we choose for today's requirements will also be able to meet tomorrow's."

Other committee members are: John Devereux, a Fort Saskatchewan farmer; Dr. Walter Harris, a chemistry professor at the University of Alberta; Murdo MacKenzie, a captain of the Calgary Fire Department; Frank Belyea, a sociologist with Alberta Environment; and waste management branch head Simpson.


Lauren Dale

Dr. Walter Harris

Harris says hazardous wastes present a significant problem in the province but optimistically feels "Alberta still has an opportunity to do things right — before we get into an irreversible mess." Harris says it is imperative that the development of a waste management system, in the vital areas of industrial and special wastes treatment, begins immediately.

"At some level and under appropriate conditions, every chemical or mixture of chemicals (and in the strictest sense chemicals include everything that is animal, mineral or vegetable as well as the air we breathe and the water we drink) can become a hazard," Harris says. "Conversely, none are hazards if present in sufficiently small quantity.

"Waste becomes hazardous when you have too much in the wrong place."

Harris says the risk from doing nothing about these wastes is greater than those involved in treating and managing them.

"We have an obligation to take care of our own garbage now. We must not leave it as a legacy for the future."

The public needs to be accurately informed of the real risks involved in hazardous waste management, Harris says; people should not be swayed by misinformation and irresponsible alarmists.

Chosen as representatives of various parts of our society, or for their individual expertise in the handling of hazardous material, the hazardous waste management committee is also gathering relevant information from other sources. Three consulting firms have been retained to prepare studies for the committee's use relating to various aspects of handling hazardous wastes. Hu Harries and Associates Ltd. have prepared an analysis of risks and investigated the economic feasibility of disposal facilities; the Dalcor Group's study examines the financial options available of ownership and management of disposal facilities; Reid Crowther and Partners Ltd. are completing a comprehensive inventory of existing hazardous wastes and making projections concerning those expected to be generated by increased provincial industrialization. The company will also establish criteria for suggested methods of disposal including transportation of hazardous wastes to disposal or storage sites.

Some committee members visited existing hazardous waste management plants in Europe and conferred with the plants' designers and management personnel. Committee chairman Kupchanko says research on these facilities shows them to be no more of a hazard than any other chemical plant, and preferable to some of the methods of waste management which are being used now in some cases.

Kupchanko says the committee will not recommend any one method or criterion for management and disposal of hazardous wastes, but is looking at the problem as a whole — public health and safety, protection against potential hazards, environmental concerns, criteria for siting and necessary regulations and controls.

"There is a lot of public concern about hazardous wastes. There is also government concern. The committee's job is to examine all available alternatives for handling hazardous wastes and come up with some sound recommendations for the public to consider."

Alberta Government Photo

Eugene Kupchanko

When the committee has completed its study and made its report, the Environment Council of Alberta (ECA) will hold public hearings across the province to obtain reaction to the committee's recommendations and to hazardous wastes in general.

The ECA is an independent Crown agency which prides itself on its ability to be completely unbiased in reporting findings and making recommendations to the environment minister. When public hearings on major environmental issues are considered necessary by government, an ECA panel goes into communities to hear submissions and opinions from the people. Panel members have varied backgrounds of interest and knowledge related to the environmental matter to be discussed; to provide continuity, the ECA's chief executive officer, Alistair Crerar, is a member of every panel.

Public hearings by the ECA on hazardous wastes in Alberta are expected to be held later this year and will give the public full opportunity to submit briefs and recommendations. The ECA will advertise where and when hearings will be held. Information meetings will be held ahead of time in certain communities to encourage the public to study the problems, develop their own viewpoints and prepare briefs and submissions to the panel. (For further information from the ECA on its hearings or on hazardous wastes, call the operator and ask for Zenith 06075.)

"Progress and new technology bring change", says Crerar. "But society has the right to be involved in effecting any change which concerns them. The council is committed to listed to the people and to involve them in important matters which could affect their environment."

Lauren Dale

Alistair Crerar

Once the ECA makes its recommendations to the environment minister, the government will make its policy decisions on how hazardous wastes can best be handled in the province. After these decisions are made, work can then start on the actual disposal of the wastes.

Joyce Gariepy is a freelance writer living in Edmonton.

Jack Spearman

Individual Responsibility

We must learn to see ourselves as part of the hazardous waste disposal problem.

Hazardous wastes are part of the cost of modern life, where chemicals and their by-products are a cornerstone of industry and commerce.

Before we complain about them, it would pay us to remember that the industries that produce them wouldn't be in business without the consumer.

Perhaps the individual Albertan should have a look at his own backyard. Grains of sand make up a beach, and the society which determines what happens to the environment is composed of everyday people.

Those everyday people have households full of assorted chemicals and compounds, themselves often highly toxic and whose manufacture often produces hazardous wastes.

It's a question of attitude, says Dennis Wighton, a University of Alberta geneticist who's co-ordinator of the university's interdisciplinary committee on environmental quality.

"There's no doubt to my mind that a lot of household chemicals are overused," he said, adding many people will reach for chemicals in a second instead of considering first what other alternatives could be used.

"People read that one dose will do this or that. They get impatient and double the dose, not thinking of the consequences."

The list of commonplace examples is long.

Many homeowners will use a liquid drain cleaner instead of a cheaper, old-fashioned plunger to clear a stopped-up sink, despite warnings on the label to wear gloves when handling and to avoid inhaling the fumes.

"If it's that hazardous in one small bottle, imagine how potent vats full in a factory would be," said Wighton.

And what happens to the empty containers of drain cleaner or insect repellant? Mostly, they go into the garbage — and end up in an overburdened landfill site.

A further problem is that people don't read the labels on household chemical products.

Wighton said most labels will list ingredients in extremely small print — not that

Eek! Look at the color of this water! It's those chemical companies you know. What do we need *them* for? They should be outlawed!
POLISH
TILE CLEANER
EACH
BRUSH CLEAN
PLASTIC WOOD
VARNISH
PAINT REMOVER
THINNER
warren clark

many people would know what the ingredients mean anyhow. And very seldom, he added, is there any mention of the shelf life of the product or how to dispose of the contents if not used.

Even hauling ordinary, biodegradable kitchen scraps out to the alley for the trashman to take away creates problems because some household garbage bags are made from polyvinylchloride (PVC).

"When you put something into a bag made from PVC you are burying something that won't decompose," said Rob Pritchard, head of the hazardous materials section of Alberta Environment's waste management branch. "If you try to burn the things, you can get toxic hydrogen chloride fumes."

The output of hazardous materials from individual houses is small in comparison to industrial hazardous product disposal, said Gordon Zieffle of the City of Calgary's sanitation department. But on those occasions when the individual does have a large quantity of pesticide or other hazardous compound, he should call the city before hauling it into the alley for the garbageman, he said.

There are more spectacular examples of chemical pollution by individuals.

A lot of publicity has been generated by scientists who worry about damage being done to the earth's ozone layer by fluorocarbons, once the most common propellant used in spray cans.

Fluorocarbons are lighter than air and when released from spray cans, float high into the stratosphere where they oxidize with ozone, the substance which screens ultra-violet rays. Those rays have been linked to skin cancer and other dermatological problems.

(However, there have been some modifications in the spray-bottle market place. More and more companies are offering sprays in finger-powered pump bottles, surely a step in the right direction.)

Pritchard cited some of the less obvious examples of how hazardous wastes are created by consumer demands.

Chrome-plated bumpers and automobile accessories are dipped in a cyanide mixture before being lowered into a tank full of chromium solution. The problem is that in time, the solution becomes too weak for plating but in terms of contact with living things, is still toxic.

Plating firms usually take their left-over solution and pour it into the ground at landfill sites.

"The same kind of thing applies to virtually every product that is metal-plated," he added.

Similar problems with weakened chemicals from perchloroethylene used in dry cleaning plants to fluids used to develop printing plates are experienced in dozens of businesses. Often, worn-out chemicals are simply poured down the sink.

Wighton suggested governments might consider a higher purchase price for products which create hazardous wastes, a step he realizes will be difficult to take. But "in the final tally, greater public awareness is the only way."

Jack Spearman is a journalist in Calgary.

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Environment Update

Dam Idea Upsets B.C.

Farmers and environmentalists in British Columbia have reacted unfavorably to the prospect of a dam on the Peace River in Alberta which they say would flood B.C. land used for market gardening and hay production.

The Dunvegan dam is widely believed to be one of a series of projects under consideration by a committee studying ways of diverting water from northern Alberta rivers to the drier southern part of the province.

However Transportation Minister Henry Kroeger, who heads the committee, is reported to have said no specific projects have been selected for the study.

Northern Development Seminar at Banff

The Banff Centre's school of the environment is sponsoring a seminar March 9-14 on northern development.

The seminar, which will cover topics ranging from transportation to oil and gas developments, is designed for environmental managers of companies both private and public, and also public interest groups.

Further information about the seminar can be obtained from David Rochefort of the school of the environment, at 762-3391.

Clean-up For Bow River

The City of Calgary is planning a $1 million clean-up project for the Bow River.

The project would involve removal of phosphorus — a nutrient contributing to heavy weed growth in the river.

The provincial government has been approached for a contribution towards the cost of the phosphorus treatment. Meanwhile the water control branch of Alberta Environment's pollution control division is co-ordinating a study into the river's phosphorus problem.

Andrew Vaughan

ECA Hearings Planned

The Environment Council of Alberta (ECA) will conduct public hearings later this year into the problems of hazardous waste management in Alberta.

The public is invited to submit briefs and recommendations to the hearings, which will take place across the province.

For further information about the hearings, or about hazardous wastes in general, call the operator and ask for Zenith 06075.

Air Pollution Index Changed

Alberta Environment has a new method of reporting the air pollution index.

Jerry Lack, head of the department's air quality branch, notes that the new index "reflects the air quality related to Alberta regulations and national air quality objectives."

Data is collected in Edmonton and Calgary from three locations — one downtown, one residential and one industrial. Five air pollutants — carbon dioxide, nitrogen dioxide, ozone, smoke and sulphur dioxide are measured. The highest index of the five is the one which is released.

The index can be obtained by a call to 427-7273 in Edmonton, and to 262-9277 in Calgary.

Computer Models For Conference

The University of Alberta faculty of extension will host a conference on computer models developed to assist in the forecasting of socio-economic impacts of growth and development.

The conference, to be held April 20-23, is directed at those interested in model development, planners and consultants at all levels of government involved in development and growth projects, planners and consultants to large development corporations, and academics interested in the socio-economic impacts of growth.

Mine Hearings Scheduled

The Energy Resources Conservation Board will open public hearings Feb. 25 into an application by Union Oil to operate a coal mine at Obed-Marsh, near Hinton.

Union's environmental impact assessment for the project will be included in the hearing, to be held at the Inn West, Hinton.

Alsands To Start Work

The Alsands consortium, led by Shell Oil, is to start work on its oil sands plant north of Fort McMurray this winter — though final government approval for the project has not yet been granted. The winter works program is considered essential to keep the project on schedule.

The winter program involves site clearing, digging of drainage ditches and some developmental drilling.

If you have a short news item of province-wide interest you'd like to contribute to Environment Update, please send it to the editor at the address on the Contents page. The editor reserves the right to select and edit the items.